

REMARKS

Applicants have amended their claims in order to further clarify the definition of various aspects of the present invention. Specifically, Applicants have amended each of claims 1 and 17 to recite that the mixed gas used in step (d) is a mixed gas of (a) a first gas less reactive with Ge as compared to reactivity of oxygen gas with Ge, and (b) a second gas having a function of etching Si. Thus, this amendment of claims 1 and 17 clarifies the first gas.

In addition, Applicants are adding new claims 30-37 to the application. Claims 30 and 34, dependent respectively on claims 1 and 17, recite that after the patterning, side edges of the SiGe layer are exposed, and that the first gas is sufficiently less reactive with Ge as compared with reactivity of oxygen gas with Ge such that during the plasma processing substantial side etching of the SiGe layer does not take place. Claims 31-33, dependent respectively on claims 30, 31, and 32, and claims 35-37, dependent respectively on claims 34, 35 and 36, quantitatively define how sufficiently less reactive with Ge the first gas is, in terms of a maximum side etching of the SiGe layer in step (d). In connection with claims 31-33 and 35-37, note, for example, the paragraph bridging pages 30 and 31 of Applicants' specification.

Applicants respectfully traverse the rejection of their claims under the first paragraph of 35 USC 112, as failing to comply with the written description requirement. As will be shown in the following, there is a description of Applicants' claimed invention in Applicants' original specification and drawings, commensurate in scope with the claimed subject matter; and, accordingly, Applicants' original disclosure clearly describes the presently claimed subject matter within the requirements of 35 USC 112, first paragraph. It is respectfully submitted that this is

the sole requirement of the description requirement of the first paragraph of 35 USC 112.

Thus, attention is respectfully directed to paragraph [0018] on page 4 of Applicants' specification, particularly together with the paragraph bridging pages 4 and 5 (paragraph [0019]). Clearly, this description in Applicants' specification shows that Applicants contemplated, as part of their invention, use of a mixed gas of a first gas hardly reactive to Ge. Noting the problem addressed by the present invention, as found by Applicants, that in using oxygen gas in the post processing, side etching occurs, the present invention avoiding this problem (note, for example, paragraphs [0008], [0009] and [0018] on pages 3 and 4 of Applicants' specification), it is respectfully submitted that Applicants' original disclosure is clear that the first gas of the mixed gas used in the post processing is less reactive with Ge as compared to reactivity of oxygen gas with Ge, as in the present claims. Note also, for example, paragraphs [0108] and [0109] on pages 26 and 27 of Applicants' specification, describing the purpose of the post processing. Note also paragraph [0112] on pages 27 and 28 of Applicants' specification, showing the problem with respect to side etching of the SiGe layer, occurring when the post processing gas used in this plasma processing includes O₂; and note especially paragraph [0117] on pages 28 and 29 of Applicants' specification, describing the source of the problem as found by the present inventors, that oxygen and Ge explosively react with each other in the plasma, and highly volatile Ge is produced, with the result that side etching is caused. Note also paragraph [0118] on page 29 of Applicants' specification, disclosing that according to the present invention, as the post processing condition, plasma processing is carried out under a mixed gas atmosphere of a gas hardly reactive to Ge and a gas having an etching function of Si. Note, further,

paragraphs [0024]-[0026] on pages 5 and 6, as well as paragraph [0121] on page 30, of Applicants' specification. Note also paragraph [0124] bridging pages 31 and 32 of Applicants' specification, describing a comparison of a mixed gas including argon, as compared with a mixed gas using oxygen, as the post processing gas.

It is respectfully submitted that taking Applicants' disclosure as a whole, including portions thereof discussed in the foregoing, it is clear that Applicants' original disclosure establishes that Applicants contemplated as part of their invention use of a mixed gas wherein the first gas is less reactive with Ge as compared with reactivity of oxygen gas with Ge, as in the present claims.

It is emphasized that Applicants' original disclosure provides specific examples of such gasses which can be used as the first gas, in the mixed gas used in the plasma post processing. It is respectfully submitted, however, that one of ordinary skill in the art would have known from Applicants' original disclosure that such gasses, being described as illustrative (note that in paragraph [0121] it is described that, for example, in place of Ar there can be used another inert gas, or nitrogen), are exemplary and not exhaustive.

Furthermore, attention is respectfully directed to claims 30 and 34, further defining the first gas as being sufficiently less reactive with Ge as compared with reactivity of oxygen gas with Ge such that during the plasma processing substantial side etching of the SiGe layer does not take place. Note also claims 31-33 and 35-37, further defining maximum limits of just what such "substantial side etching" is, within the contemplation of the present invention. In view of the additional recitations in claims 30 and 34, as well as in claims 31-33 and 35-37, it is respectfully submitted that these claims further set forth the subject matter of the presently claimed invention, consistent with the description in Applicants' original specification and

drawings, so as to further satisfy the description requirement of the first paragraph of 35 USC 112. That is, it is respectfully submitted that Applicants' original specification and drawings clearly satisfy the description requirement of the first paragraph of 35 USC 112, with respect to subject matter claimed in claims 30-37, in view of recitations in these claims 30-37 in light of Applicants' original specification and drawings.

The contention by the Examiner in the second paragraph of Item 2, on page 2 of the Office Action mailed September 20, 2006, that since O₂ is very reactive with Ge, the scope of gasses which may be used as the first gas in the etchant is much larger in the presently claimed invention than what is disclosed in the specification of the present application, is noted. However, it is respectfully submitted that assuming, arguendo, that there are a large number of gasses which may be used as the first gas, this is not a basis for rejecting the claims as failing to satisfy the description requirement, where the original specification and drawings describe the invention in broad terms.

The contention by the Examiner that the specification gives no guidance of what gasses may be used as the first gas other than to say that it is a gas which is hardly reacted with Ge, such as N₂ or Ar, is respectfully traversed. It is respectfully submitted that Applicants' original disclosure extensively describes the problem and source of the problem addressed by the present invention, that is, the side etching occurring in the post processing when using conventional post processing mixed gasses; and avoiding such problem according to the present invention, utilizing, as the first gas of the mixed gasses used in the post processing, a gas avoiding etching of Ge so as to avoid such side etching. Moreover, emphasizing that Applicants' original disclosure describes the role of oxygen in the disadvantageous side etching,

and that the present invention avoids such side etching, as expressly recited in various of the present claims, it is respectfully submitted that Applicants clearly give guidance as to gasses which may be used as the first gas.

The additional contention by the Examiner that the scope of what is enabled by the specification is much narrower than what is claimed in the claims, is noted. Initially, it is noted that the issue of enablement is a separate issue from the issue of the written description requirement. Thus, with respect to rejection of claims as failing to comply with the written description requirement, it is respectfully submitted that the contention by the Examiner as to enablement is irrelevant.

In any event, it is respectfully submitted that the Examiner errs in concluding that the scope of what is enabled by the specification "is much narrower than what is claimed in the claims". Contrary to this conclusion by the Examiner, it is respectfully submitted that one of ordinary skill in the art could determine gasses for the first gas, within the scope of the claims, without undue experimentation. That is, one of ordinary skill in the art, utilizing a specific gas, could easily determine whether such gas is less reactive with Ge as compared with reactivity of oxygen gas with Ge. Even if some experimentation were required in connection with a specific gas, it is respectfully submitted that such experimentation would not be undue. See In re Angstadt, 190 USPQ 214 (CCPA 1976).

The rejection of claims under the second paragraph of 35 USC 112, as being indefinite, is respectfully traversed. In this regard, it is respectfully submitted that one of ordinary skill in the art could determine whether any first gas, of a mixed gas including a second gas having a function of etching Si, was less reactive with Ge as compared to reactivity of oxygen gas with Ge. In other words, it is respectfully submitted that one of ordinary skill in the art could determine whether any specific

gas fell within or outside the scope of the first gas as recited in the present claims.

Under the present circumstances, it is respectfully submitted that the second paragraph of 35 USC 112 requires nothing more. See In re Moore, 169 USPQ 236 (CCPA 1971).

The statement by the Examiner in Item 4 on page 3 of the Office Action mailed September 20, 2006, that the phrase “a first gas less reactive to Ge as compared with oxygen” is confusing, since “it does not match the scope of what is enabled by the specification for the first gas”, is noted. It is respectfully submitted that such matching of the scope of what is enabled by the specification for the first gas is not an issue under the second paragraph of 35 USC 112. See In re Borkowski, 164 USPQ 642 (CCPA 1970). As stated previously, as one of ordinary skill in the art could determine whether a performed process, including a gas used in post processing, fell within or outside the scope of the present claims, requirements of the second paragraph of 35 USC 112 are satisfied.

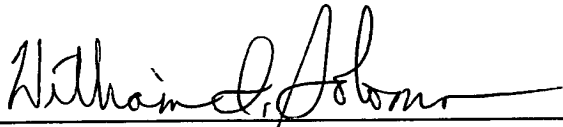
The contention by the Examiner in Item 5 on page 3 of the Office Action mailed September 20, 2006, is respectfully traversed. It is respectfully submitted that as the original disclosure of the parent applications fully discloses the presently claimed subject matter, and provides an enabling disclosure thereof, the present application is a proper Divisional application of the parent applications thereof.

In view of the foregoing comments and amendments, reconsideration and allowance of all claims presently in the application are respectfully requested.

Applicants request any shortage in fees due in connection with the filing of this paper be charged to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (case 1374.39812VV2), and credit any excess payment of fees to such Deposit Account.

Respectfully submitted,

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